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(71) Applicant(s)  
**Richard Deehan**  
**26 Kensington Park Road, LONDON, W11 3BU,**  
**United Kingdom**

**(72) Inventor(s)**  
**Richard Deehan**

**(74) Agent and/or Address for Service**  
**Ablett & Stebbing**  
**45 Lancaster Mews, Lancaster Gate, LONDON,**  
**W2 3QQ, United Kingdom**

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(56) Documents Cited  
 GB 2287535 A GB 2249202 A EP 0636863 A1  
 EP 0509775 A2 WO 92/02891 A1 US 5364093 A  
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**International Defence Review 8/1993 page 656**

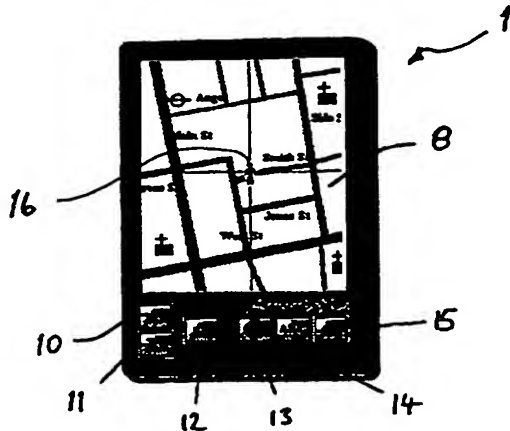
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UK CL (Edition O ) G1F F1H , H4D DAB DPBC DSDA  
DSDB DSDX  
INT CL<sup>6</sup> G01C , G01S , G09B

**(54) Portable guidance device**

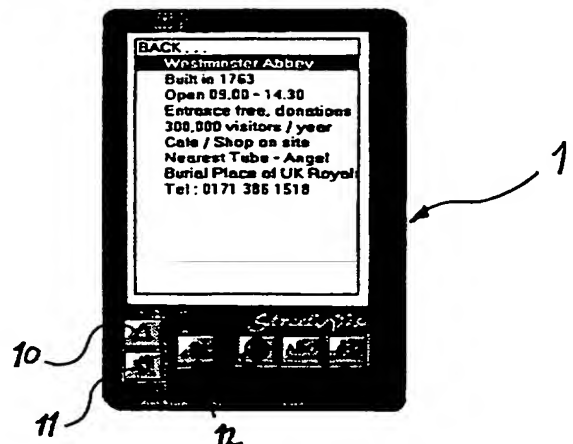
(57) Hand-held device 1 contains a GPS receiver, radio-wave triangulation position sensor, compass and/or an INS system. It displays the position of a user on a map of the area including places of interest. It may also display a list of nearby places of interest (fig 4) and details of a selected one of them. Places may be sought using a menu of categories of interest (fig 6). A route to one of them may be shown (fig 7). The device has a cover to prevent damage.

Alternatively, the device may be in the form of a head-up display within a pair of spectacles. Local information including the maps is contained in digital form on a cartridge (6, fig 1)

### Figure 2



**Figure 5**



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

**The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995**

GB 2 298 539 A

Figure 1

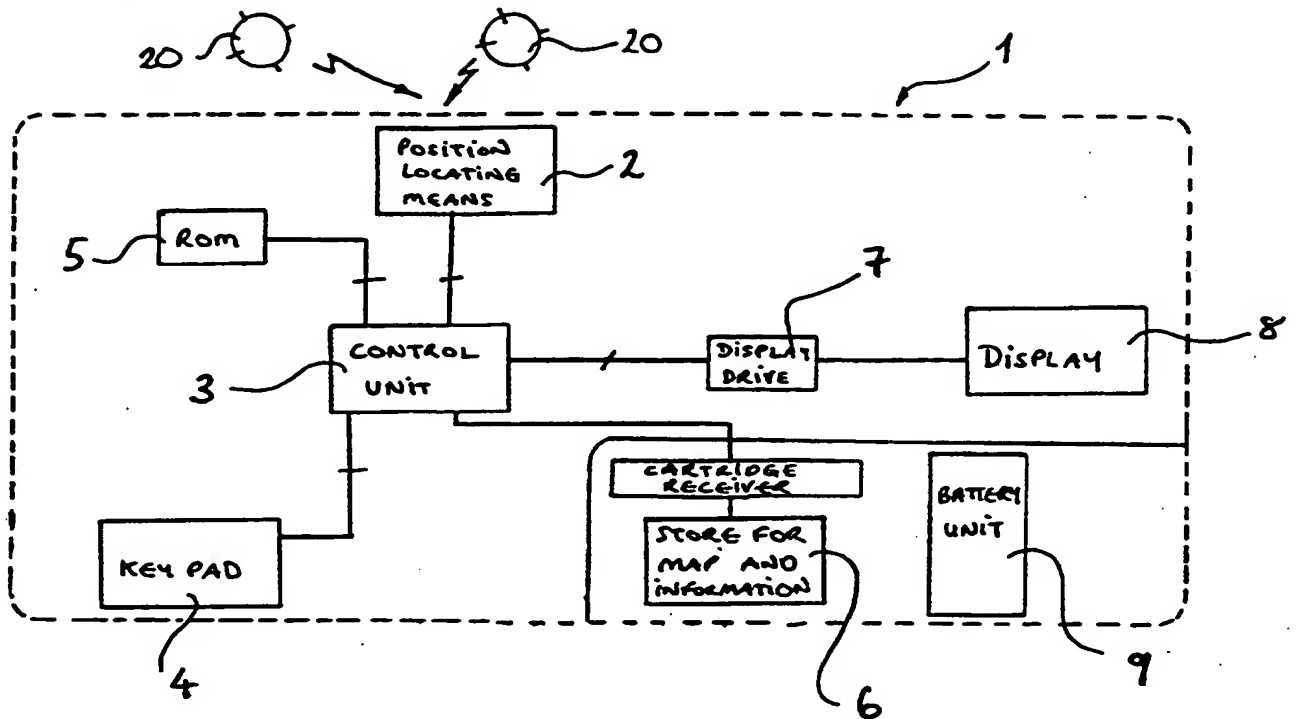


Figure 2

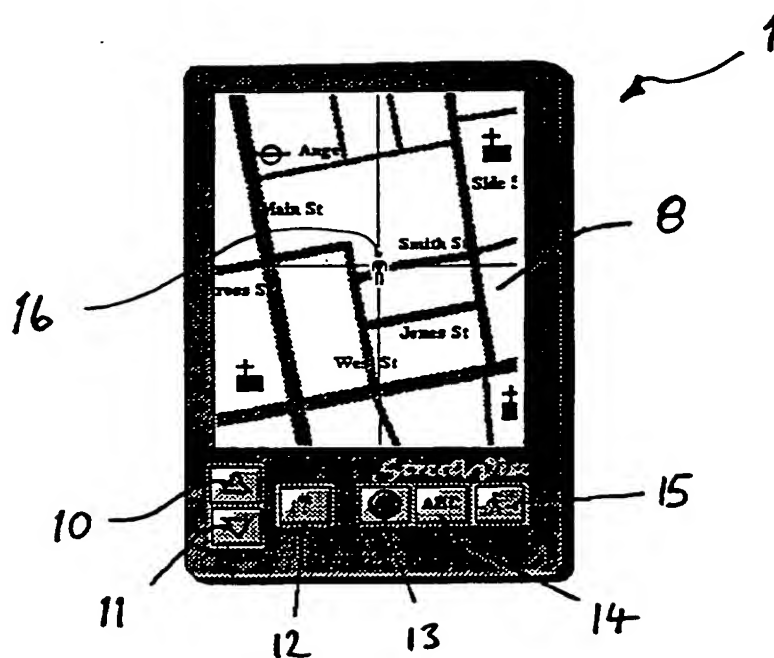


Figure 3

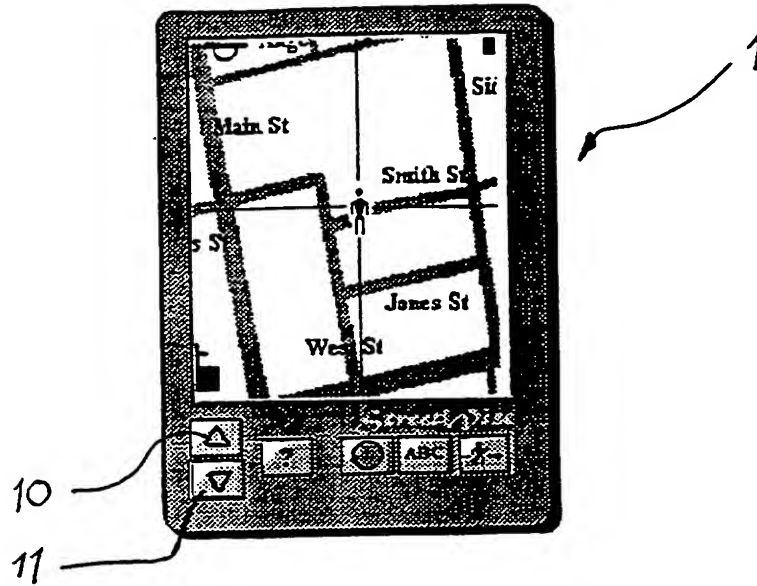


Figure 4

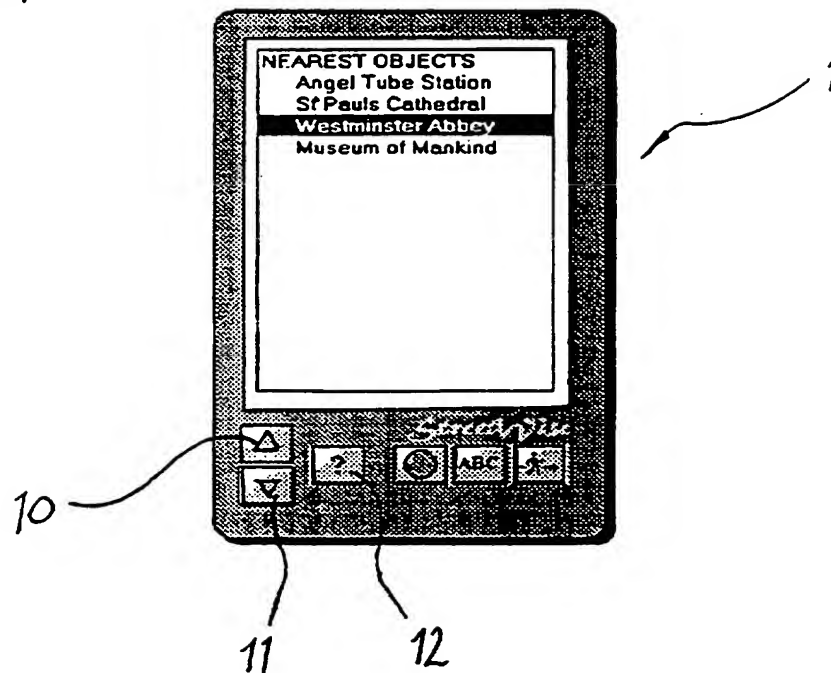


Figure 5

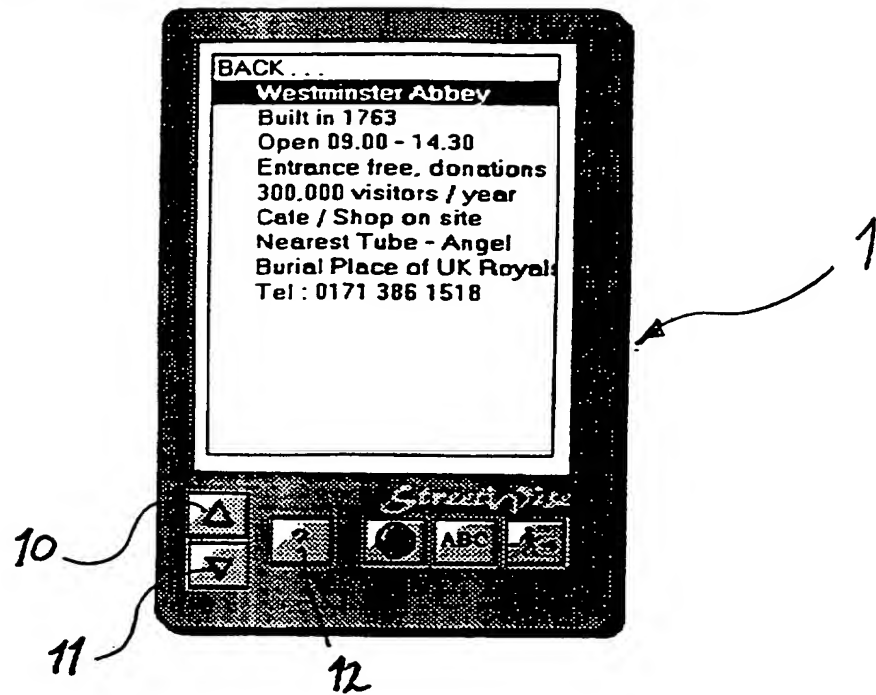


Figure 6

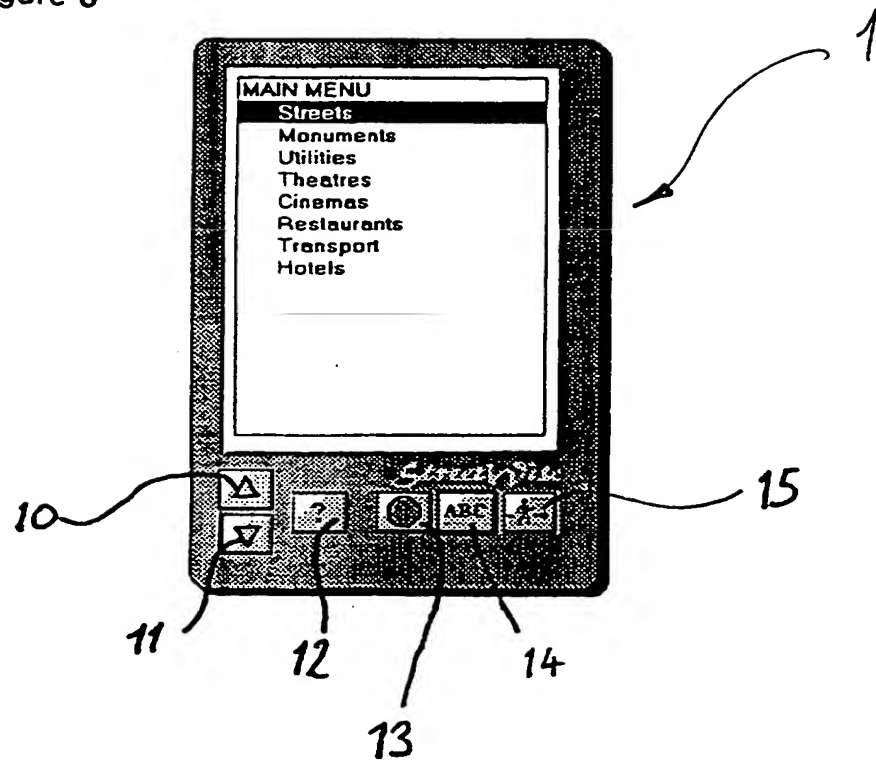
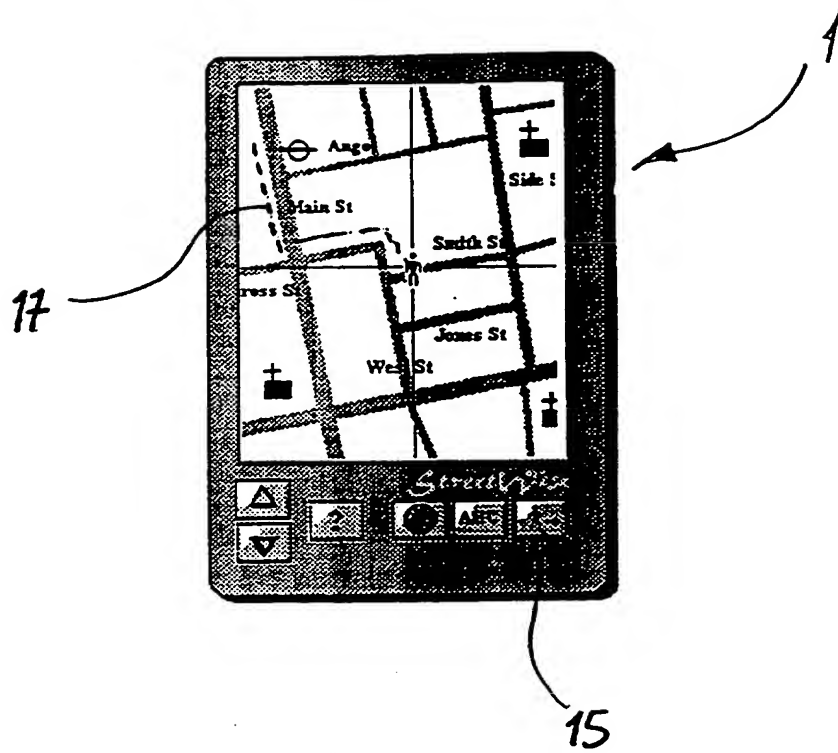


Figure 7



## PERSONAL GUIDE DEVICE

The present invention relates to a personal guide device and more particularly to such a device for assisting the movement  
5 of an individual through a specific area.

On arrival in an unfamiliar area or location, e.g. a foreign city, it can often be very difficult to readily find one's way around. Unfamiliar sign-posting which may be in a foreign  
10 language can be disorientating and confusing. Whether the area is being visited for business or recreational reasons, valuable time can be lost in not following the most expedient route to a particular location, for example, a tourist attraction or a business meeting. In a business context,  
15 becoming lost in an unfamiliar place can lead to late arrival at a business meeting thus causing frustration and embarrassment.

For any visitor to an unfamiliar location, there is also the  
20 increased risk of personal injury and robbery, particularly should that visitor stray into less desirable areas.

Moreover, when limited time is available, the confusing effect of foreign and unfamiliar sign-posting can be intensified. In  
25 such circumstances stress levels can become raised, often leading to rash decisions being made which can put the welfare of an individual at risk, for example, where such an individual crosses a road in circumstances where he or she would normally seek a safer and more suitable place or time  
30 to cross the road.

When on a visit to an unfamiliar location, it can be desirable and useful to have information concerning a particular building or landmark. For example, a tour of a city centre  
35 can be made more interesting and enjoyable by having details to hand of the history of certain buildings. Moreover, to assist in getting around a city, is helpful to have to hand

details of bus routes and timetables, for example. However, to carry all such information concerning a particular area around in the form of maps, leaflets and books and to easily access it is impractical.

5

Certain forms of vehicle navigational systems are known. For example, in EP-A-0 542 331, there is disclosed a vehicle navigation device which can navigate the vehicle user on a predetermined route. The device includes a Global Positioning  
10 System (GPS) whereby positional data of the device is derived from satellite transmissions, the positional data being displayed on a display unit within the vehicle interior. Such a device is thus provided as part of the instrumentation within the vehicle. Such devices, whilst offering advantages  
15 in providing relatively general information to a vehicle user in association with road navigation, are clearly inappropriate on a personal level to an individual requiring very specific information concerning their surroundings.

20 It is thus an object of the present invention to provide a device for an individual which by providing the relevant information as to the position of the device and its surroundings, seeks to overcome the problems identified above.

25 According to an aspect of the present invention there is provided a guide device comprising:-

a position locating means for establishing the position of said device; and

a display for displaying the established position on a  
30 digitised map of the local surroundings;

wherein the device is portable so as to be for personal use by an user.

With such a device, a user has to hand a means for ensuring  
35 that they can easily and accurately determine where they are, so that the frustration and potential risks of becoming lost in an unfamiliar location are obviated.

In preferred embodiments, the device is hand held. This allows the device to be readily operated

5 Preferably, the position locating means comprises a global positioning system (GPS). Such systems provide an accurate and absolute means for establishing positional data.

Alternatively, the position locating means may comprise a radio wave transmission triangulation system.

10

In preferred embodiments, the digitised map includes street names and points of interest.

15 Conveniently, the device includes means for selecting additional information about certain articles depicted in the display.

20 Preferably, the device includes a route finder means for identifying and displaying a specified location. The device may then display a favoured route between the position of the device and a location specified by said user.

25 In preferred embodiments, the route finder means further can establish and display a favoured route between any two locations specified by a user.

30 Conveniently, display information concerning specific areas is stored on removable data cartridges. In this way, the size of the device is not compromised by having to incorporate large memory banks. A separate cartridge can merely be inserted for the area to be visited by the individual.

35 Preferably, the device further comprises a dead reckoning unit which can establish the current position of the device from the last set or fixed point by extrapolation. In this arrangement the user may initially manually input the position of the device from which time the dead reckoning unit, e.g.



a laser movement sensor, determines any subsequent location of the device.

In preferred embodiments, the device comprises a compass  
5 arrangement for effecting rotation of the information being displayed in accordance with the orientation of the device.

Conveniently, the device includes means for displaying a  
digitally produced image of a selected item. The item may be  
10 produced as a 3-dimensional image. In this way a user can call up a particular item for easier recognition or is, by having a truer visual representation of what they are supposed to be seeing, aided in determining which way they are facing.

15 Preferably, the device includes audio playback means for playing back audibly the text on the display. Thus, where viewing of the display becomes impeded, for example, the user can still benefit from the information displayed thereon.

20 In preferred embodiments, the device includes a zoom function whereby certain areas of the display can be enlarged or reduced.

Conveniently, the device also includes a rechargeable power  
25 source.

Preferably, the device includes a cover for preventing  
accidental damage to the display. The cover may accommodate  
an ariel.  
30

In preferred embodiments, the display may be provided as a  
head-up display within a pair of glasses, for example  
sunglasses.

35 Certain preferred embodiments will now be described with reference to the accompanying drawings; of which:-

Figure 1 shows in diagrammatical form the main elements of a guide device according to a first embodiment of the present invention;

- 5 Figure 2 shows a view of the external appearance of the guide of Figure 1;

Figures 3 to 7 show different operating modes of the device of Figure 1.

10

The present invention relates to a device which can be readily used by, for example, tourists or a business person on arrival in an unfamiliar location.

- 15 As shown in Figure 1, a personal guide device 1 comprises the components of a position locating means 2, a control unit 3, a key pad 4, a Read Only Memory (ROM) 5, a data retrieval unit 6, a display drive 7, a display 8, and a detachable battery unit 9. The ROM 5 includes positioning software and main  
20 control software for the device, the ROM being accessible by the control unit 3.

- The position locating means 2 takes the form of a Global Positioning System (GPS) which acts to locate the position of  
25 the device using transmission of satellites 20. Information concerning the position of the device is fed to and processed by the control unit 3, as are instructions and data inputted from the keypad 4.

- 30 The data retrieval unit 6 is provided in the form of a detachable cartridge and includes a socket suitable for connection with a cartridge receiver provided on the device. The cartridge includes a data store of digitalized map details and information concerning certain points or areas. This data  
35 store is also accessed by the control unit according to commands keyed in via the key pad 4.

Information can be displayed on the display, which takes the form of a low power consumption LCD screen 8, driven by display drive 7. A rechargeable battery unit 9 is provided to power the components in the personal guide device.

5

Figure 2 shows the outer appearance of the device. As shown, the device includes a number of buttons which control its use and allow different operating modes to be selected. In this regard, the key pad includes 'zoom/scroll' buttons 10 & 11, a 'more information/select' button 12, a 'reset' button 13, a 'main menu' button 14 and a 'plot route' button 15.

Use of the guide device will now be described with reference to Figures 2 to 7. In the standard display mode shown in Figure 2, the device display 8 shows the position of the device and thus the user in relation to a map of the surrounding area. For closer detail of the particular location of the device, 'zoom' buttons 10 and 11 can be operated to enlarge or then reduce the relative size of the map in relation to the display. An enlarged map is shown in Figure 3. As shown, the user icon in the form of a figure 16 remains at the centre of the display.

On depression of the 'more information/select' button 12 (the help button) a menu of surrounding objects of interest can be displayed, as shown in Figure 4. Using the 'zoom/scroll' buttons 10, 11, one can move around in the menu and then select a desired entry by again depressing the more 'information/select' button. In so doing, further information concerning the items selected is displayed, as is shown for example in Figure 5. It is always possible to return to the main menu shown in Figure 6 or to go back to a previous screen.

The main menu includes search facilities for entities of interest in the area in question as well as auto-routing software which allows the user to specify a street, place or

other location and then offering the facility of plotting a best route between the user's current location and a specified destination. The route is shown as a dotted or highlighted line 17 on the display shown in Figure 7. Alternatively or  
5 additionally the best route may be expressed as text, detailing the street names to follow. Once a route has been selected, the route itself is dynamic, namely, as the user moves, the graphical path changes accordingly as will the text based street route.

10

In a further embodiment of the device, a dead reckoning unit is provided additionally to the GPS unit. The dead reckoning unit may take the form of a miniaturised laser system and is used to determine the position of the device in cases where  
15 the primary position locating detector has difficulty in fixing a location, for example, due to interference caused by the presence of tall buildings masking GPS transmissions or where the device is being used indoors. In this event the dead reckoning system determines the current position of the device  
20 by extrapolating from the last acceptable fixed positioning determined by the GPS unit.

A bearing indicator may be provided on the screen and may comprise a simple magnetic compass arrangement. The compass  
25 arrangement may alternatively include means for carrying out differential analysis of information from the position locating means so as to allow a compass heading of the device to be determined. The compass arrangement may be arranged to rotate the displayed map according to orientation of the  
30 device. Pieces of text on the map, for example, street names can be arranged to orientate themselves with respect to the orientation of the device. This results in less confusion about which street on the map is the same street from a user's point of view.

35

Also, for further information purposes and assistance in identifying the position of the user, the software may be such

so as to be capable of displaying digitally produced images of certain sights, monuments, points of interest on the display. This capability may be used to show a user what a particular item should look like for easy recognition, or for  
5 example what the user should have before them and which way they are facing. Such images may be provided as 3-dimensional images, for example, a wire frame image or a blocked image would suffice to assist the user in this respect.

10 Furthermore, the device may include means for audio playback thereby audibly "reading out" text to the user. The data cartridge may moreover be able to include phrases in the dominant language of the area in question together with their translations into the user's language. The user may therefore  
15 use the device to look up a phrase which the device will then play back audibly via an integral speaker (not shown) or listen to a text based description displayed on the screen instead of reading it.

20 Whilst the device preferably includes a Global Positioning System (GPS) to locate the position of the device, alternative means for determining the position of the device may be used, for example, a radio station triangulation system whereby the known positions and transmitting wavelengths of a number of  
25 radio stations around a particular area may be used to determine the position of the device by way of a triangulation calculation. In this connection, so-called fuzzy logic in the internal software of the device may be used to obviate reception difficulties caused by multiple signal pulse from  
30 radio stations.

Furthermore, the position locating means of the device may in a further alternative work by receiving signals from known pre-positioned radio beacons, whereby in a similar fashion to  
35 radio station triangulation, the beacon signals can be used to identify the position of the device.

In a further alternative, a user of the device may on arrival at a specified location, input his location manually into the device whereafter only a dead reckoning unit in the form of for example, a laser movement sensor is used to update the  
5 device as to its position.

Whilst the display 8 preferable comprises an LCD screen any suitable alternative display means may be utilised. The screen may be monochrome or colour and have illumination means for  
10 night time use.

The display screen is shown as a planar element but may in a preferred embodiment be provided as a head-up screen on the inside of the lens or lenses of a pair of glasses.  
15

The removable data retrieval unit preferably provides a store of city-specific information including, for example, digital street maps of a city and its surroundings, information on monuments, sights, utilities, transport facilities, public  
20 institutions, parks, etc. The unit may however also include sponsorship information in the form of advertisements. Such cartridges may for example be purchased or hired out by, e.g. hotels for relevant areas. The data retrieval unit may take  
25 any suitable form, for example a cartridge as described above, a smart card, a CD ROM or other disk or indeed a receiver for picking up transmissions from places of interest or from satellites or radio transmitters.

The power source is preferably provided in the form of a  
30 rechargeable battery unit which when required, is connected to a suitable charging unit. However, any suitable power means may be used, including for example solar power means.

Preferably, the device has standby mode where it automatically  
35 turns itself off if motionless and not used for a predetermined time. In this way power can be conserved.

- 10 -

The device may have a cover (not shown) to prevent accidental damage to the LCD screen. The cover may incorporate an ariel which is moved into a receiving position with the cover open. Opening and closing of the cover could also activate and  
5 deactivate the device.

CLAIMS:

5

1. A guide device comprising:-

a position locating means for establishing the position of said device; and

a display for displaying the established position on a digitised map of the local surroundings;

wherein the device is portable so as to be for personal use by an user.

2 A guide device according to claim 1, wherein the device is hand held.

3. A guide device according to claim 1 or 2, wherein the position locating means comprises a global positioning system (GPS).

20

4. A guide device according to claim 1 or 2, wherein the position locating means comprises a radio wave transmission triangulation system.

25 5. A guide device according to any preceding claim, wherein the digitised map includes street names and points of interest.

6. A guide device according to any preceding claim further comprising means for selecting additional information about certain articles depicted in the display.

7. A guide device according to any preceding claim, further comprising a route finder means for identifying and displaying a specified location.



8. A guide device according to claim 7, wherein the route finder means is arranged to establish and display a favoured route between any two locations specified by a user.

5 9. A guide device according to any preceding claim, wherein display information concerning specific areas is stored on a removable data cartridge.

10 10. A guide device according to any preceding claim, further comprising a dead reckoning unit which can establish the current position of the device from the last set or fixed point by extrapolation.

15 11. A guide device according to any preceding claim, further comprising a compass arrangement for effecting rotation of the information being displayed in accordance with the orientation of the device.

20 12. A guide device according to any preceding claim, further comprising means for displaying a digitally produced image of a selected item.

25 13. A guide device according to any preceding claim, further comprising audio playback means for playing back audibly the text on the display.

14. A guide device according to any preceding claim, further comprising a zoom function whereby certain areas of the display can be enlarged or reduced.

30 15. A guide device according to any preceding claim, further comprising a rechargeable power source.

35 16. A guide device according to any preceding claim, further comprising a cover for preventing accidental damage to the display.

17. A guide device according to any preceding claim, wherein the display is provided as a head-up display within a pair of glasses.

- 5 18. A guide device substantially as hereinbefore described with reference to the accompanying drawings.



Application No: GB 9503883.2  
Claims searched: all

Examiner: Dr E P Plummer  
Date of search: 8 January 1996

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): H4D(DAB,DPBC,DSDA,DSDB,DSDX), G1F(F1H)

Int Cl (Ed.6): G01S, G01C, G09B

Other:

**Documents considered to be relevant:**

Category	Identity of document and relevant passage		Relevant to claims
E,X	GB2287535A	University of Surrey whole document, but particularly figures 1 & 2, abstract, page 5 lines 17 to 23, page 15 line 13, page 16 lines 2 & 3.	1,2,3,5,7, 8,11,13,14
X	GB2249202A	Fuke Osamu eg abstract, figures 7 and 9 &JP06-015022	1,2,3,6, 12,15
X	EP0636863A1	Aisin AW whole document	1,3,5,6,7, 8,10,13,15
X	EP0509775A2	Pioneer Electronic eg column 1 lines 2 & 3, figure 3 and corresponding description	1,3,10
X	WO92/02891A1	Georesearch nb page 6 lines 1 to 5, page 9 line 23 to page 10 line 2, page 14 line 28 to page 15 line 11, page 19 line 27 to page 21 line 1	1,2,3,6,15
X	US5364093	Huston eg abstract, column 4 lines 55 to 58	1,2,3,6,9, 15,16

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



The  
Patent  
Office

15

Application No: GB 9503883.2  
Claims searched: all

Examiner: Dr E P Plummer  
Date of search: 8 January 1996

Category	Identity of document and relevant passage	Relevant to claims
X	US4513377 Nippondenso whole document	1,3,9,10, 15
X	International Defence Review 8/1993 page 656	1,3,9,15, 16

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined  
with one or more other documents of same category.

& Member of the same patent family

A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before  
the filing date of this invention.  
E Patent document published on or after, but with priority date earlier  
than, the filing date of this application.